

Claims

1. An apparatus for conditioning a polishing pad used in chemical mechanical planarization of semiconductor wafers, the polishing pad moving in a forward direction, the apparatus comprising:

a liquid distribution unit having at least one opening upon which liquid is forced through at high pressure, the opening positioned facing the polishing pad;

a liquid recovery unit for retrieving liquid and debris, the liquid recovery unit positioned downstream from the liquid distribution unit and having at least one opening connected with a vacuum; and

a housing forming a liquid chamber disposed around the opening of the liquid distribution unit and a vacuum chamber disposed around the opening of the liquid recovery unit, wherein the vacuum chamber is in communication with the liquid chamber.

2. The apparatus of claim 1, wherein a bottom surface of the housing is in communication with the polishing pad.

3. The apparatus of claim 1, further comprising a seal disposed along a length of a bottom surface of the housing, the seal located between the housing and the polishing pad.

4. The apparatus of claim 1, further comprising an abrasive substance disposed along at least a portion of a bottom surface of the housing, the abrasive substance located between the housing and the polishing pad.

5. The apparatus of claim 1, wherein the polishing pad has a width, and the housing has a length that is at least equal to the width of the polishing pad.

6. The apparatus of claim 1, further comprising:
a slurry recovery unit for retrieving slurry, the slurry recovery unit
positioned upstream from the liquid container and having at least one opening
connected with a vacuum.

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7. The apparatus of claim 6, wherein the housing forms a slurry
chamber disposed around the opening of the slurry recovery unit.

8. The apparatus of claim 1, wherein the polishing pad is mounted
upon a linear belt polisher.

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9. The apparatus of claim 1, wherein the housing further comprises a
containment portion surrounding the liquid distribution unit and the liquid
recovery unit, and a curved portion disposed around the opening of the liquid
recovery unit.

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10. An apparatus for conditioning a polishing pad in a semiconductor
wafer polishing device, the apparatus comprising:

a liquid distribution unit forming at least one opening, the opening
directed at the polishing pad; and

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a liquid recovery unit positioned downstream from the liquid
distribution unit and in communication with the polishing pad, the liquid recovery
unit forming at least one opening.

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11. The apparatus of claim 10, wherein the liquid distribution unit forms
a series of small openings, the polishing pad has a width, and the series of small
openings span at least 50% of the width of the polishing pad.

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12. The apparatus of claim 10, wherein the liquid distribution unit forms
a series of small openings, the polishing pad has a width, and the series of small
openings span substantially all of the width of the polishing pad.

13. The apparatus of claim 11 or 12, wherein the small openings
comprise nozzles.

14. The apparatus of claim 10, wherein the liquid distribution unit
comprises a liquid container for storing an amount of liquid, the liquid container is
in communication with the opening of the liquid distribution unit.

15. The apparatus of claim 14, wherein the pressure within the liquid
container is maintained at a pressure of about 15 PSIG to about 100 PSIG.

16. The apparatus of claim 10, wherein the opening of the liquid
distribution unit forms a slit.

17. The apparatus of claim 16, wherein the polishing pad has a width,
and the slit spans substantially all of the width of the polishing pad.

18. The apparatus of claim 10 wherein the opening of the liquid
recovery unit is connected with a vacuum.

19. The apparatus of claim 18, further comprising a curved portion
disposed around the opening of the liquid recovery unit, in order to increase the
amount of suction by the vacuum on the polishing pad.

20. The apparatus of claim 18, wherein the polishing pad has a width,
and the liquid recovery unit spans substantially all of the width of the polishing
pad.

21. The apparatus of claim 18, wherein the vacuum applies a suction
force of about -3 PSIG to about -10 PSIG to the polishing pad.

22. A method for conditioning a polishing pad used in chemical mechanical planarization of semiconductor wafers, the polishing pad containing an amount of slurry, the method comprising:

5 applying a stream of pressurized liquid to the polishing pad; and
 removing a significant amount of slurry and liquid from the polishing pad using a vacuum.

23. The method of claim 22 further comprising:

10 removing at least a portion of the slurry from the polishing pad using a vacuum, before the applying of a stream of pressurized liquid; and
 running the removed slurry through a slurry reclaim system in order to remove impurities from the slurry.

24. The method of claim 22 wherein the applying of a stream of
15 pressurized liquid further comprises applying the stream of pressurized liquid along a substantial amount of the width of the polishing pad.

25. The method of claim 22 further comprising providing a housing
20 around the stream of pressured liquid and the vacuum, the housing in communication with the polishing pad.